UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 3, 1993

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

EPA-SAB-CAACAC-LTR-93-011

Honorable Carol M. Browner
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

Subject: Science Advisory Board's review of the Office of Policy, Planning, and Evaluation 's (OPPE) and the Office of Air and Radiation's (OAR) progress on the prospective study of the impacts of the Clean Air Act.

Dear Ms. Browner:

On June 8, 1993, the Clean Air Act Compliance Analysis Council (CAACAC) met to address a variety of issues related to the design of the prospective Clean Air Act (CAA) benefit/cost studies required by Section 812 of the CAA amendments of 1990. The discussions at that meeting reflected both the Charge provided to the Council at the start of this series of reviews, and issues raised by background documents and oral presentations.

This meeting was responsive to our expressed view that CAACAC involvement early in the design stage of this research would be desirable, and we appreciate that responsiveness by the Agency. We believe it is critical to maintain this sort of outside scientific involvement throughout the study process, if only as a guard against having the EPA's unavoidable institutional stake in the outcome of the research affect design and implementation decisions.

As a final general point, we would urge the Agency to continue to reflect on the ultimate purpose of this activity. Is it to prepare Congress for the next round of authorization of the CAA? Is it to develop databases, methods, or results that will be useful in EPA decision-making? Or is some completely different purpose being served? Is it more important to be able to analyze the 1990 CAA Amendments as a

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package or to isolate the incremental impacts of individual provisions? (Several Council members believe that the latter is clearly more important and that the study design should assign most weight to provision-specific analyses. On the other hand, all recognize the conceptual difficulty of incremental analysis of provisions that bear on non-attainment). While all can agree at the most general level that the objective is to produce reliable estimates of costs, benefits, and the dependence of costs and benefits on uncertain functions and parameters, having a clear, simple vision (in written form) of what exactly this study is intended to accomplish is likely to help allocate scarce research dollars efficiently. The number of objectives the study is to satisfy should be minimized to reduce the uncertainty and cost of the effort.

The following specific issues were addressed:

a) Baseline Definition

The Council feels that it would be undesirable to employ in the prospective study the "no CAA" baseline used in the retrospective study. Rather, the counterfactual world used as a baseline should be one in which the 1990 CAA Amendments were not enacted. Construction of a consistent baseline of this sort for, say, the 1990-2010 period involves a host of complexities, of course, particularly as regards non-attainment (Similar complexities arise in connection with projecting the actual future, of course). Although we are sympathetic to the Agency's desire to concentrate resources on the analysis of the actual world rather than the counterfactual baseline world, we think it is important to keep in mind that the product of the analysis will be statements about differences between the two. Thus the quality of the study results will be critically dependent on the quality of the baseline. If the baseline is not consistent and plausible, the study's results will neither be valid or interesting.

We are sympathetic with a number of the EPA proposals for simplifying the construction of a baseline. Thus, for instance, it probably makes sense to hold dominant air quality standards fixed. It may be sensible to hold implementation standards fixed at 1990 levels in the baseline world, though this is less clear. In any case, baseline emissions should vary over time in response to economic changes consistent with those employed in predicting actual future emissions; we do not believe it would be plausible to hold emissions constant at 1990 (or any other) levels. We believe it will be useful and informative to employ a range of GDP growth

forecasts in this analysis, including at least the Administration's official forecast and the Data Resources Incorporated (DRI) model long-term forecast.

b) Benefit and Cost Analysis

The problem of estimating benefits in the prospective study is more difficult than in the retrospective study. The Agency staff is grappling with this problem seriously and effectively, and we urge them to use the CAACAC as a resource in this process. In addition, we feel obliged to repeat a point we have made before, simply because it is so important. In assessing changes in risk for benefit analysis purposes, attention should center on mean or median values, not on the 95th percentile or similar extreme values that are generally employed for regulatory purposes. Thus meta-analysis techniques are more appropriate for combining the results of multiple studies in this context than methods that concentrate on studies with extreme results.

In terms of cost analysis, we are comfortable with the staff's proposal to stress detailed analysis of a relatively few critical sectors rather than analysis of economy-wide general equilibrium effects. While inter-industry effects may be important in an absolute sense, we believe that the experience of the retrospective study, combined with the much greater level of technological uncertainty here, suggest that it is likely to be much more important to understand intra-industry effects in key industries.

We also believe it is likely to be critically important to analyze carefully the positive and negative impacts of the 1990 CAA Amendments on technology, and this can best be done at the industry level. While there is almost certainly some induced innovation as a consequence of tightened environmental standards, there is also almost certainly some reduced innovation on other fronts. Recent research suggests that the net negative impact on productivity could be substantial. In any case, impacts of the 1990 Amendments on the rate and direction of technical progress are likely to be hotly debated, and they should accordingly be carefully studied.

c) Uncertainty

We believe that the prospective study must make clear how scientific, economic, and other uncertainties translate into uncertainty regarding costs and benefits. Even more than in the retrospective study, presentation of "best estimates" without more would be seriously misleading. We are pleased that the staff is sensitive to this

issue and strongly support their view that the management and analysis of uncertainty must be a central focus of the entire research effort.

We agree that because uncertainties regarding the effects of emissions are particularly important, a good deal of the analysis of uncertainty can be done through post-emissions-model sensitivity analyses to alternative assumptions regarding such things as alternative emissions-exposure and exposure-response functions and alternative valuation approaches. But we would urge the Staff not to lose sight of the potentially important uncertain variables affecting emissions and costs -- including economic growth, relative prices of natural gas and gasoline, and costs of air toxics control.

We appreciate the opportunity to review the progress to date on the design and implementation of the CAA benefit/cost studies and look forward to receiving your response to the major points raised in this letter.

Sincerely,

Dr. Richard Schmalensee
Chair
Clean Air Act Compliance Analysis Council

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